# 3. TREND ANALYSIS

Growth in aviation activity within Virginia, and changes in the composition of the aircraft fleet mix operating within the Commonwealth, have significant implications regarding the airport facilities that are necessary to effectively serve demand. Insights concerning likely future changes in the level and characteristics of both commercial and general aviation traffic can be gained by examination of historic trends at individual airports within Virginia, and for the Commonwealth's airport system as a whole. However, Virginia's aviation system does not operate in isolation, and changes that are occurring in the aviation industry on a nationwide global basis will ultimately impact development patterns within Virginia. The purpose of this Trend Analysis is to identify significant developments and trends that are occurring nationally that are likely to impact future growth patterns within Virginia.

The study team identified five major industry developments that have had or are likely to have an impact on future commercial or general aviation air traffic at Virginia airports. These trends are identified below:

1. US Airways is the dominant carrier at many of Virginia's commercial airports. Increased competition from full-fare carriers, along with the growing East Coast presence of low-fare specialist Southwest Airlines, have placed increasing pressure on US Airways' financial performance. Following the failed acquisition attempt by United Airlines and in the aftermath of September 11th terrorist attacks, many industry analysts consider US Airways a leading candidate for Chapter 11 bankruptcy. Given US Airways strong presence at many of the Virginia commercial airports, a potential bankruptcy—which could be followed by reorganization and a continuation of service—could lead to at least a short-term disruption in services.[1]

2. The entry of Southwest Airlines at Norfolk in the fall of 2001, and the carrier's announced intention to initiate services at Richmond in the future, will bring low fare services to the Commonwealth that have been largely absent to this point. Historic air fare levels at Virginia airports have been quite high by national standards and the entry of Southwest Airlines will bring about a meaningful reduction in airline pricing at key Virginia airports. Improved air fares should produce significant levels of passenger traffic stimulation, and may also result in a re-distribution of passenger traffic between individual airports in the Commonwealth.

3. There is a fast growing presence of 30- to 70-seat regional jet (RJ) aircraft in the fleets of commercial airlines serving Virginia. The regional jet has permitted new nonstop services at many Virginia airports, and growing numbers of RJ's in the U.S. fleet should promote continued development of nonstop service in moderate density hub and point-to-point markets.

[1] US Airways filed for bankruptcy protection in August 2002. The carrier has continued to operate and is currently in the process of reorganization.

4. Growth in the general aviation industry resumed in the 1990's following passage of the General Aviation Revitalization Act (GARA) that provided product liability protection to aircraft manufacturers. Sustained economic growth in the U.S. economy coupled with the recent trend toward fractional aircraft ownership were important contributors to general aviation growth in Virginia and nationwide. The state of the economy, changes in fuel prices and continuing growth in fractional ownership programs will drive future growth in general aviation activity.

5. The terrorist attacks of September 11, 2001 represent the most important development shaping near-term aviation trends across the U.S. In the months following the attacks, commercial passenger traffic levels fell by over 20 percent nationwide, U.S. airlines implemented substantial capacity reductions, and the industry is experiencing massive financial losses. Commercial airports have incurred a sharp reduction in revenues, which combined with requirements for major security upgrades are placing a serious strain on airport financial resources. The possibility of subsequent terrorist incidents in either the commercial or general aviation sectors, and the ultimate speed of industry recovery will be key determinants regarding the long term impacts of these events.

In many cases, there are clear inter-relationships between the trends and industry developments identified above. For example, the terrorist attacks and resulting decline in passenger traffic and revenues placed increasing pressure on the financial position of US Airways. Similarly, the entry of Southwest Airlines at Norfolk and its potential future entry at Richmond represent continued expansion of low fare competition in US Airways core market area. The regional jet has been a key competitive weapon deployed by full fare airlines such as American and Delta to enter markets previously controlled by US Airways, and US Airways itself has identified the capability to acquire and operate increased numbers of RJ's as critical to its future survival.

The events of September 11$^{th}$ have the potential to promote increased reliance on general aviation, as businesses make greater use of corporate aircraft and fractional ownership as substitutes for commercial airline travel. Conversely, the possibility of terrorist attacks launched from general aviation facilities would have major consequences regarding security requirements at general aviation airports which, in turn, could have implications regarding the capability to operate and support the current broad and diverse network of GA airports across the Commonwealth.

Several of the trends described above are discussed in greater detail in the following sections of this chapter. These trends are relevant to the forecasts of general aviation and commercial airline activity developed in the course of the VATSP Update and described in subsequent chapters of this report. They are also explored to provide insight concerning some of the opportunities and risks that may face Virginia, its system of airports, and the traveling public in future years.

## Impacts of the September 11th Terrorist Attacks

The tragic events of September 11, 2001 have had a profound impact on our nation and its citizens. In addition to personal tragedies, the impact to the economy and the disruption of our air transportation system have been significant. The U.S. airlines suffered a complete shutdown of services for three days as the Federal Aviation Administration (FAA) and other government agencies responded to the need for immediate increases in airport and airline security.

Immediately following the resumption of services, passenger traffic levels dropped significantly as travel plans were cancelled or postponed. For the full month of September 2001, U.S. airlines reported traffic declines ranging from 30 to 40 percent. While it is likely that depressed levels of airline service and passenger traffic will persist for some time, airline results in the months that have followed indicate that a gradual recovery is underway.

It is useful to recall that our air transportation system has dealt with serious disruptions in the past, due to events such as economic recessions and threats of terrorism caused by the Gulf War and the loss of Pan Am 103. In all previous cases, the U.S. air transportation industry has rebounded and long-term growth in air travel has resumed. In response to past terrorist incidents, this recovery has occurred within a single year. While the nature and impacts of the September 11th attacks are far more extensive than previous terrorist incidents, significant steps have been taken to respond. Security levels have been heightened at airports and onboard commercial aircraft. New federal aviation security legislation has been enacted, providing additional safeguards to the traveling public. And, in an unprecedented measure, the U.S. government authorized a $15 billion recovery program to ensure the ongoing viability of our airlines and the national air transportation network.

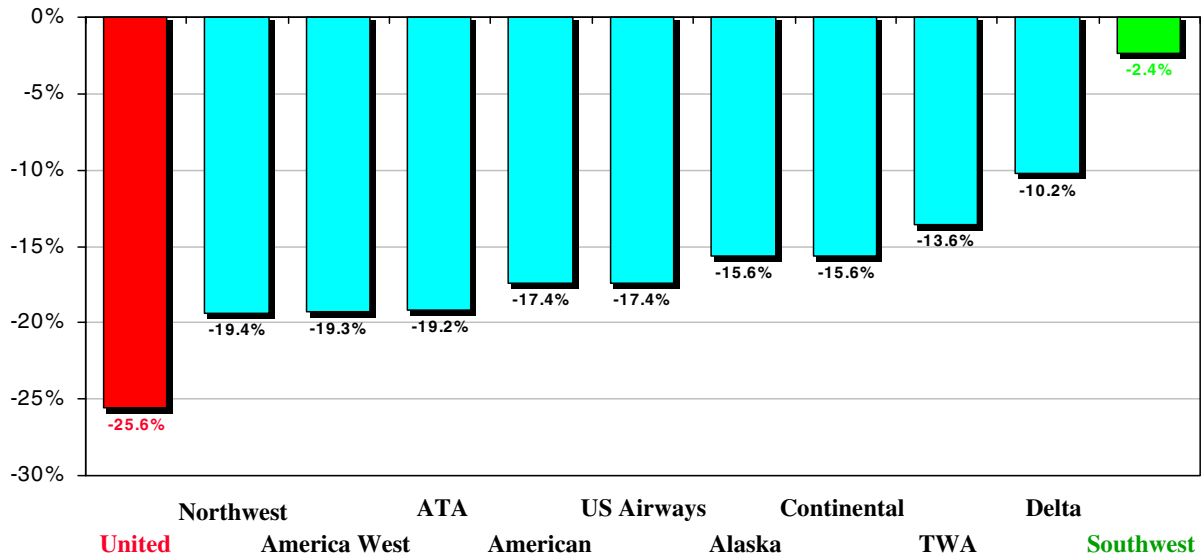
## Changes in U.S. Airline Services Following September 11

In response to depressed levels of passenger traffic, U.S. airlines have implemented capacity reductions across their route networks. Between September and November of 2001, the average U.S. carrier reduced seat capacity by 15 percent. This capacity reduction was accomplished by parking aircraft and reducing the daily utilization of aircraft remaining in service. Changes in airline seat capacity following September 11th are shown below in Exhibit 1. Among major U.S. carriers, United Airlines implemented the steepest decline in capacity, reducing scheduled seat departures by 25.6 percent. Virginia's leading carrier—US Airways—reduced capacity by 17 percent while Delta Air Lines dropped 10 percent of its daily seats. Southwest Airlines exhibited the smallest reduction in network capacity with only a 2.4 percent decline, and the carrier initiated new service to Norfolk as planned.

**TA - Exhibit 1**

**Percent Change in Daily Scheduled Seats**

*Pre September 11th vs. November 2001*

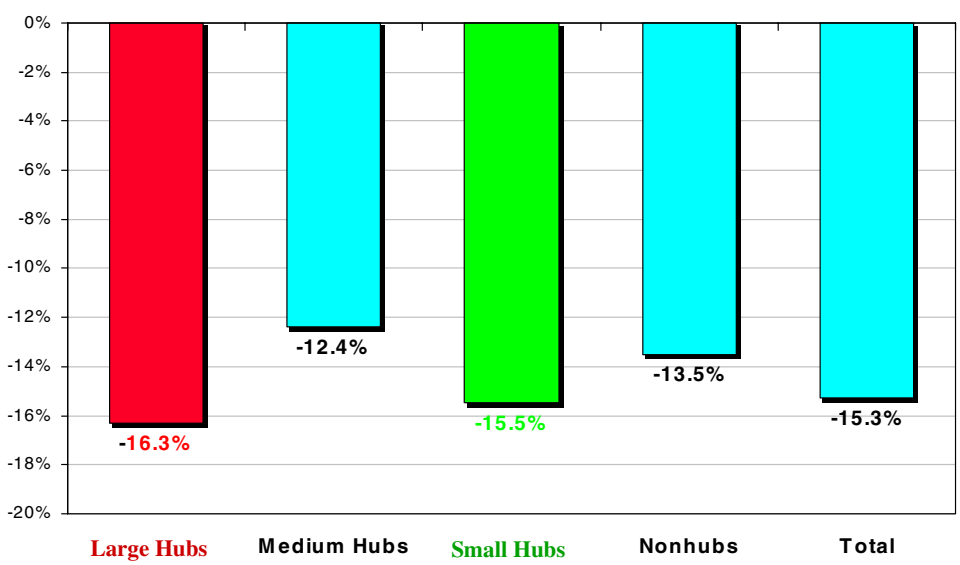



Airports of all sizes have been affected by these capacity reductions. As shown in Exhibit 2, airline seats have dropped by similar percentages at airports in all hub classifications, with Large, Medium, Small, and Non-Hub airports experiencing average capacity reductions of between 12 and 16 percent since September 11th.

**TA - Exhibit 1**

**Percent Change in Daily Scheduled Seats**

*Pre September 11th vs. November 2001*

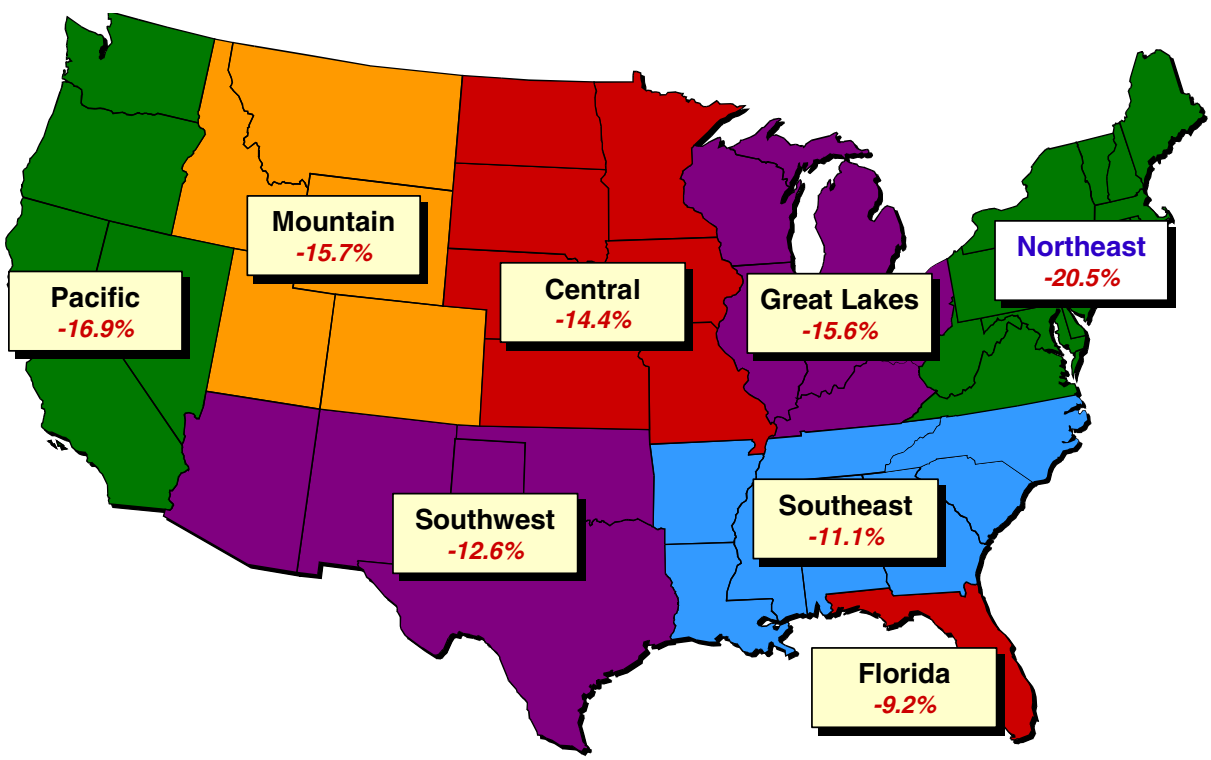


At individual airports, however, the impacts of September 11th have produced widely differing impacts. At Washington Reagan National Airport, airline seat capacity dropped by 51 percent between September and November, 2001 due to security-related restrictions on the number of flights that could be operated. Flights at Reagan National are being restored in phases, with the most recent increases (December 2001) bringing flight volume to 66 percent of pre-September 11 levels. Other major Northeast airports such as Boston Logan, Newark, and New York JFK each experienced seat capacity declines of between 25 and 30 percent between September and November, 2001.

Overall, the Northeast region (including Virginia) experienced the greatest reduction in airline service following the September 11 attacks, with a capacity reduction of 20.5 percent. Airports in Florida, the Southeast, and the Southwest regions experienced the smallest reductions in scheduled services, with capacity reductions ranging from 9 to 13 percent, respectively. Changes in airline seat capacity by U.S. region are displayed in Exhibit 3.

**TA - Exhibit 3**

**Decline in Capacity After 9/11 by Region**

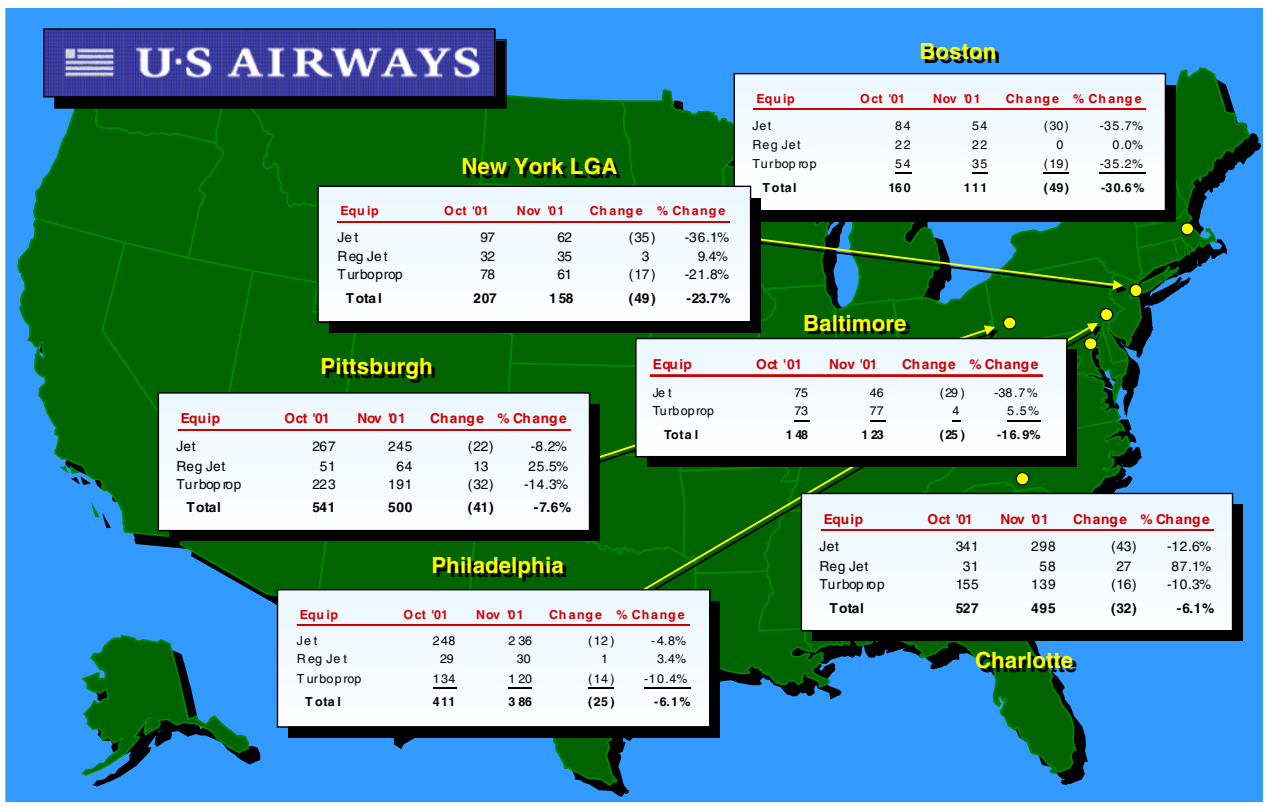



At connecting hub airports, the majority of capacity reductions have occurred in the early morning and late evening hours, as hub carriers have eliminated or downsized the first and last connecting banks of the operating day. At individual hub airports, schedule reductions have varied considerably with some hubs relatively unaffected by the events and aftermath of September 11 and other hubs experiencing significant

service reductions. Exhibits 4 through 6 highlight changes in hub schedules for Virginia's three largest carriers—US Airways, United and Delta. Among the connecting hubs most significant to Virginia passengers, US Airways reduced its scheduled flights at both Charlotte and Philadelphia by 6 percent with Pittsburgh down 8 percent, Delta's flight schedule at Atlanta was reduced by 8 percent (while flight volume at Cincinnati was slightly increased), and United reduced its departures at Washington Dulles by 27 percent and Chicago by 16 percent.

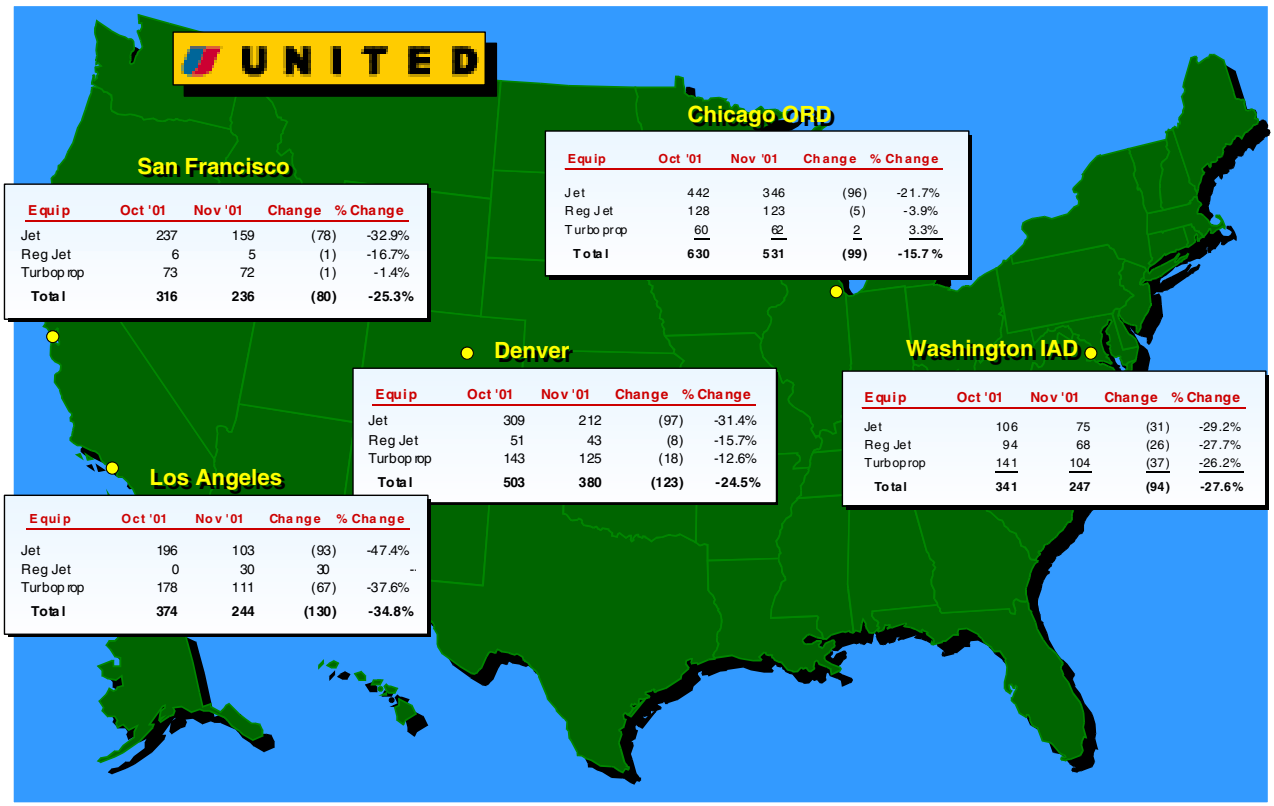
**TA - Exhibit 4**

**Service Changes from US Airways Hubs**



## TA - Exhibit 5

## Service Changes from United Hubs




**San Francisco**

| Equip | Oct '01 | Nov '01 | Change | % Change |
|---|---|---|---|---|
| Jet | 237 | 159 | (78) | -32.9% |
| Reg Jet | 6 | 5 | (1) | -16.7% |
| Turboprop | 73 | 72 | (1) | -1.4% |
| **Total** | **316** | **236** | **(80)** | **-25.3%** |

**Chicago ORD**

| Equip | Oct '01 | Nov '01 | Change | % Change |
|---|---|---|---|---|
| Jet | 442 | 346 | (96) | -21.7% |
| Reg Jet | 128 | 123 | (5) | -3.9% |
| Turboprop | 60 | 62 | 2 | 3.3% |
| **Total** | **630** | **531** | **(99)** | **-15.7%** |

**Denver**

| Equip | Oct '01 | Nov '01 | Change | % Change |
|---|---|---|---|---|
| Jet | 309 | 212 | (97) | -31.4% |
| Reg Jet | 51 | 43 | (8) | -15.7% |
| Turboprop | 143 | 125 | (18) | -12.6% |
| **Total** | **503** | **380** | **(123)** | **-24.5%** |

**Washington IAD**

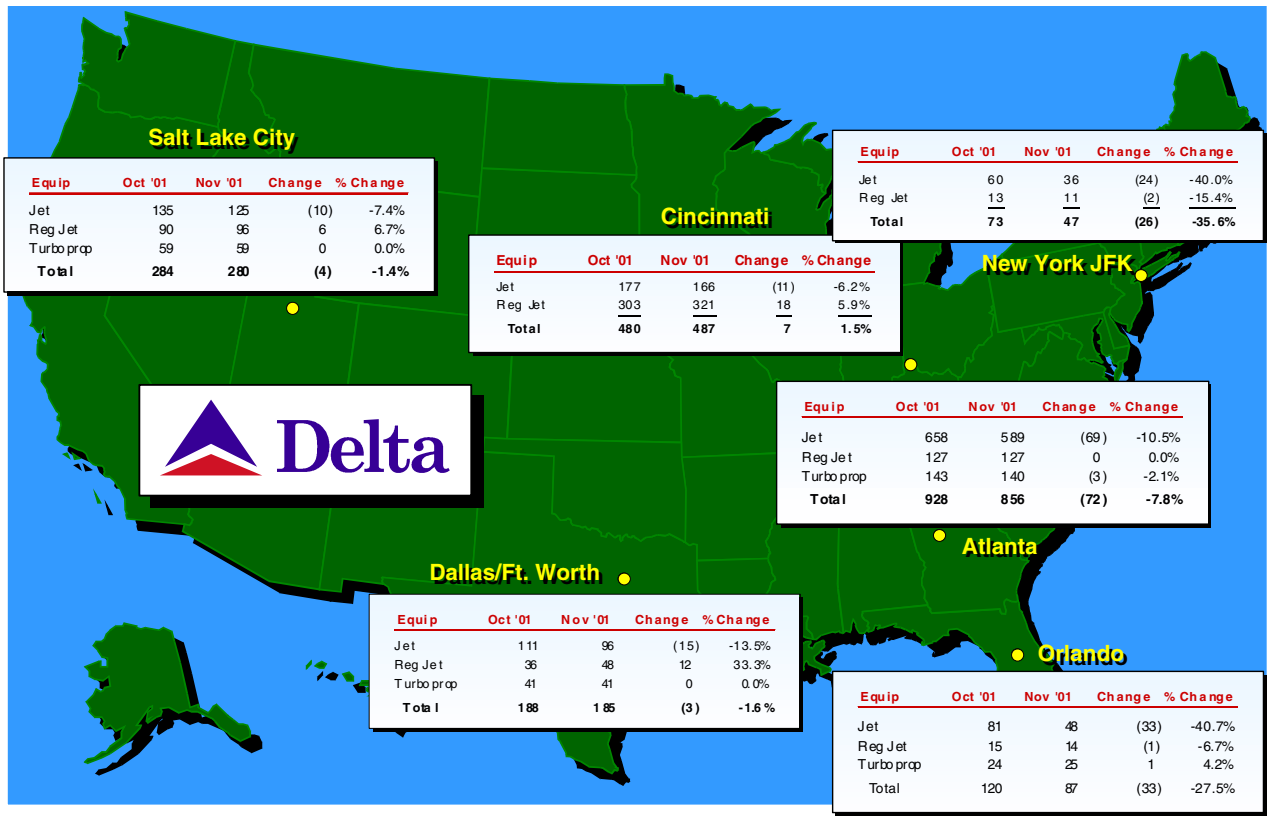
| Equip | Oct '01 | Nov '01 | Change | % Change |
|---|---|---|---|---|
| Jet | 106 | 75 | (31) | -29.2% |
| Reg Jet | 94 | 68 | (26) | -27.7% |
| Turboprop | 141 | 104 | (37) | -26.2% |
| **Total** | **341** | **247** | **(94)** | **-27.6%** |

**Los Angeles**

| Equip | Oct '01 | Nov '01 | Change | % Change |
|---|---|---|---|---|
| Jet | 196 | 103 | (93) | -47.4% |
| Reg Jet | 0 | 30 | 30 | -- |
| Turboprop | 178 | 111 | (67) | -37.6% |
| **Total** | **374** | **244** | **(130)** | **-34.8%** |

**TA - Exhibit 6**

**Service Changes from Delta Hubs**




## Service Level Changes at Virginia Airports

Between September and November, 2001, scheduled airlines services at Virginia airports declined by 31 percent in terms of flight departures and 28 percent based on total seat capacity. The aggregate Virginia impacts are heavily weighted by the two metropolitan Washington airports—Reagan National and Dulles—which together accounted for approximately 80 percent of CY 2000 commercial airline traffic in the Commonwealth. Excluding the two Washington-area airports, the remaining seven Virginia commercial airports experienced a 16 percent reduction in scheduled airline departures (consistent with the U.S. average of 15.3 percent). Airline seat capacity at Virginia's seven small- and non-hub airports dropped by 9.9 percent—less severe than the U.S. as a whole (down 15 percent).

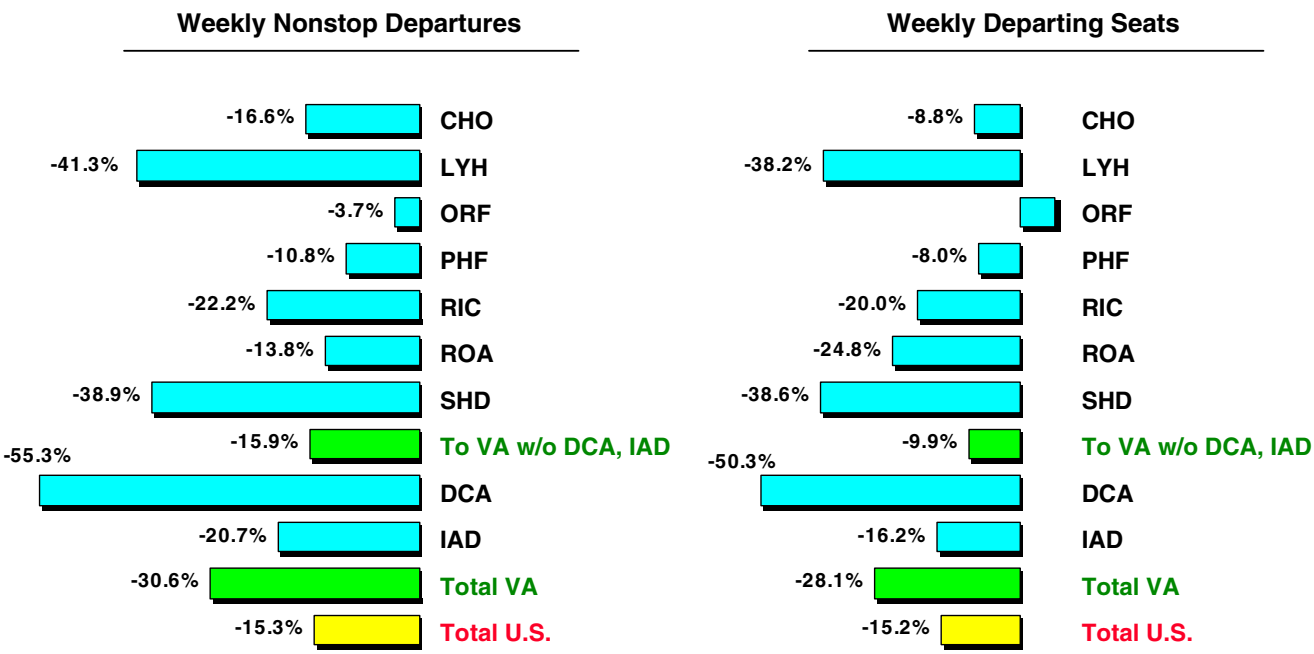
As shown in Exhibit 7, however, several of Virginia's smallest airports have experienced serious reductions in airline service subsequent to the events of September 11th. Commercial airline services at Shenendoah Valley and Lynchburg declined by approximately 40 percent between September and November. At Shenendoah Valley, United and US Airways regional carriers reduced service to Dulles and Pittsburgh, respectively, causing daily departures to drop from 8 to 5. At Lynchburg, regional airlines

operating for US Airways and United implemented service reductions to Charlotte, Pittsburgh, and Washington Dulles, and total daily flights declined from 21 to 13 between September and November. Subsequently, United Express has completely withdrawn from the Lynchburg market.

**TA - Exhibit 7**

**Post September 11th Schedule Reductions**

*Schedule Change September 2001 to November 2001*




Airline capacity reductions at Richmond and Roanoke ranged from 20 to 25 percent following September 11, while Charlottesville and Newport News experienced smaller seat capacity declines of approximately 8 percent. At Norfolk, the entry of Southwest Airlines in October offset capacity reductions by other carriers, and led to a 3 percent overall gain in available seat capacity.

**TA - Exhibit 8**

**Factors Impacting Commercial Traffic Growth in the Aftermath of September 11th**

| Factor | Impact | Duration |
|---|---|---|
| Fear of Flying | Negative | Short-Term |
| Increased Security: | | |
| Added Trip Time | Negative | Short to Mid-Term |
| Added Trip Cost | Negative | Long-Term |
| Airline Schedule Reductions | Negative | Mid-Term |
| Fare Discounting | Positive | Short-Term |
| Airline Financial Condition | Negative | Mid-Term |
| U.S. Economy | Negative | Short to Mid-Term |

Looking forward, the events of September 11 and the subsequent declines in passenger demand and airline services will affect future growth in commercial aviation in a variety of ways. Exhibit 8 identifies six discrete factors arising from the terrorist events that will drive the future pace of industry recovery. These factors are as follow:

**Fear of flying**. The events of September 11 caused many passengers to defer or cancel travel plans. This reaction was responsible for the substantial reductions in passenger traffic that occurred subsequent to the terrorist attacks, and led to several of the secondary impacts listed below. Barring further terrorist events, it is expected that passenger confidence in the aviation system will be restored based on the significant and highly publicized increases in airport and airline security, and as passengers resume travel and gain comfort in the post-September 11 environment.

**Increased Security**. Improvements in air travel security are essential to prevent further air terrorist events, and to restore passenger confidence in the safety of airline travel. Enhanced security measures have or will be implemented in passenger screening, the handling of checked baggage and onboard commercial aircraft. While enhanced security is necessary to assure safety in air travel, increases in airport and airline security have the potential to increase the time and cost associated with airline trips, as passengers are subject to increased screening requirements and the costs of security enhancements are passed on to travelers. Increases in airline trip time and cost could

depress passenger demand, particularly on short-haul trips where added time and cost related to security would be most significant in terms of total trip time and costs. While the added cost of security is expected to represent a long-term by-product of the September 11th events, the added time related to increased screening of passengers (and checked baggage) should diminish as procedures and technologies are developed to maintain the efficiency and convenience of air travel. In the months following the September 11th attacks, there has already been a noticeable reduction in the additional time required to comply with increased security requirements and this trend should continue into the future.

**Airline Schedule Reductions**. Passenger demand is sensitive to the quantity and quality of available airline services, and the airline capacity reductions that have occurred in the aftermath of September 11th have had a depressing impact of passenger demand. Airlines are expected to gradually restore services as passenger demand rebounds to pre-September 11th levels. As a result, the service reductions that have been implemented should not represent a long-term deterrent to future growth in passenger demand.

**Fare Discounting**. Just as airlines reduced capacity following September 11th, air carriers have also implemented steep fare discounts in an effort to lure back passengers. While these fare reductions have represented the one positive factor in terms of post-September 11th air travel demand, the availability of fare discounts should diminish as the ongoing recovery in air travel demand re-aligns passenger traffic with airline seat capacity.

**Airline Financial Conditions**. The deep decline in passenger demand following the events of September 11 has had a serious impact on the financial performance of U.S. airlines. Major U.S. carriers lost $2 billion during the 3rd Quarter of 2001, and losses for the 4th quarter were expected to be even greater. The declines in traffic and revenues resulting from September 11th have created a very realistic possibility that one or more major U.S. airlines could fail in the coming year.[2] In the past, major carriers have successfully re-structured and emerged from bankruptcy (Continental, America West) but others such as Eastern and Pan Am have shut down. In the event of a carrier failure, connecting hub airports in the carrier's route network can be vulnerable to significant reduction in services. Non-hubbing airports dominated by origin-destination passenger traffic generally see rapid replacement of services by other airlines, although small markets heavily dependent on a connecting hub in the failed carrier's network can experience a more lasting impact. Overall, the possibility of one or more airline failures would be expected to cause at least a short-term disruption in services at communities heavily reliant on the affected carriers.

[2] Both US Airways and United Airlines filed for bankruptcy protection in 2002. At the time of publication, both carriers are continuing to operate and each is attempting to reorganize and emerge from bankruptcy.

**State of the U.S. Economy**. Economic growth is a principle driver of the growth in air travel demand. The U.S. economy was already weak prior to September 11th and was subsequently declared to be in recession. The length of the recession and the rate of subsequent recovery will have a significant impact on future growth in both commercial and general aviation in Virginia.

The events of September 11th will bring lasting changes to commercial aviation in this country, particularly in the area of airline and airport security. The short-term effects of the terrorist attacks on commercial aviation have been dramatic, and have or will cause a series of secondary impacts on the U.S. airline industry, airports, and air travelers, as described above. Several of these secondary impacts have created immediate difficulties and near-term risks for Virginia airports and air travelers. It is expected, however, that passenger demand will recover and recent industry reports indicate that this recovery is already underway. An eventual recovery in passenger demand will dissipate many of these secondary impacts, allowing the industry to regain its financial health and enabling growth in the underlying demand for air travel to continue.

General aviation activity was restricted in the aftermath of September 11, particularly at airports in the proximity of Washington DC, New York City, and Boston. While most restrictions have been lifted, the Federal Aviation Administration has issued a series of security recommendations for GA airports. The possibility that acts of terrorism could originate from GA facilities—as highlighted by the recent incident involving a student pilot from Tampa FL—suggest that the current recommendations for GA airport security could become formal regulations.

While there is much uncertainty regarding future security requirements for general aviation airports and pilots, it is reasonable to anticipate that GA security standards will be significantly upgraded. Potential GA security measures are likely to include airport perimeter security, control of airfield access, and pre-flight screening of pilots, passengers, and aircraft.

Future security requirements could strain the financial resources of many public use GA airports. Depending on the availability and sources of funding, stringent GA airport security regulations could force states across the nation to concentrate their funding resources at a core system of public use GA airports. This risk has not been explicitly incorporated in the GA activity forecasts presented later in this report. However, the GA airport inventory, the review of airport roles, and the demographic coverage analysis performed in the course of this System Plan would provide the analytic foundation to support any future decision making process.

### Growth in 30- to 70-Seat Regional Jet Aircraft

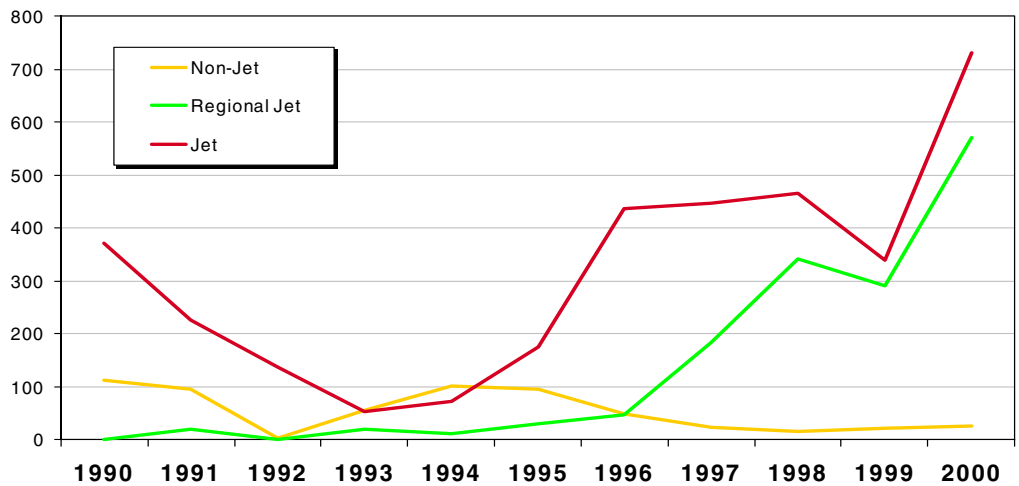
Regional jet (RJ) aircraft with 30 to 70 seats are rapidly entering the fleets of U.S. commercial air carriers and are providing services at a number of airports within the Commonwealth of Virginia. Since use of these aircraft has increased dramatically in recent years and since this growth is expected to continue, it is

important to understand how these aircraft are utilized and what roles they may play in the future development of Virginia's aviation system.

Exhibit 9 presents the aircraft orders placed by North American passenger carriers over the past ten years. While regional jets played only small role in the early 1990's when the 50-seat Canadair Regional Jet (CRJ) first entered service, these aircraft rose to prominence in the late 1990's as new regional jet types such as the 37- to 50-seat Embraer Regional Jet (ERJ) and the 32-seat Fairchild-Dornier 328JET (FRJ) also entered production. Concurrent with the increase in RJs, orders for turboprop aircraft have declined, and in the year 2000, more than 20 regional jet orders were placed for every turboprop that was ordered.

**TA - Exhibit 9**

**Aircraft Orders Placed by North American Passenger Carriers**




*Source: ACAS Fleet Database, October 2001.*

US Airways, the dominant carrier at many of Virginia's commercial airports, also currently provides the most RJ services through its regional affiliates Transtates, Chautauqua, and Mesa, which all fly ERJs.[3] Delta is Virginia's second leading RJ operator through its regional carriers Comair, AC Jet, and Atlantic Southeast, which fly CRJs and FRJs. American Eagle also flies a significant number of ERJs from airports within the Commonwealth.

[3] November 2001 OAG Schedule for Virginia airports excluding IAD and DCA.

**TA - Exhibit 10**

**RJ Routes Served from Virginia Airports (Ecluding IAD and DCA) – November 2001**


*Source: OAG Schedule Database, November 2001.*

As shown in Exhibit 10, which presents the current RJ markets served from Virginia airports (excluding DCA and IAD), regional carriers are deploying RJs in a variety of roles:

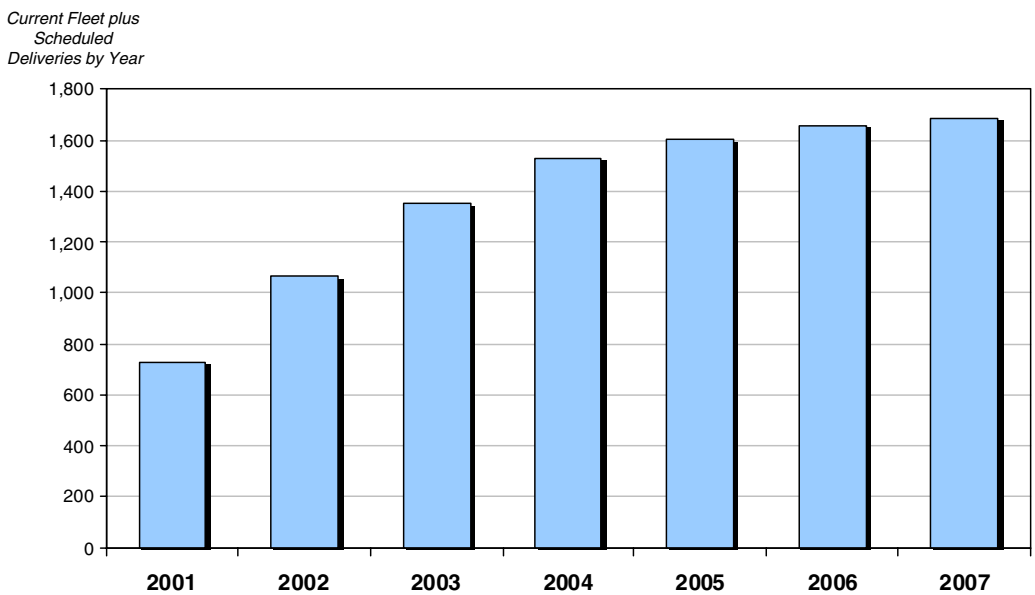
- Â To serve new nonstop markets: RJs extend the range for regional carriers to 1,000 miles and beyond (compared to the effective range of approximately 400 miles for turboprop services). They also permit nonstop services in low-volume markets incapable of supporting conventional narrowbody jets with 100 or more seats. For example, the Roanoke-Chicago service by United Express and the Norfolk-Toronto service by Air Canada represent new nonstop markets served from Virginia airports due to the availability of regional jets.
- Â To replace turboprop services: Passengers often find jet service more attractive than turboprop service, and many regional carriers are consolidating their operations on jet aircraft. For example, Delta (Comair) replaced many of the Embraer Brasilias on its Charlottesville-Cincinnati route with CRJs. Similarly, Continental Express replaced Brasilias with ERJs on its Norfolk-Cleveland route.

- To facilitate entry into competitive markets: Carriers are deploying regional jets to stage competitive entry into high volume markets dominated by other carriers. American Eagle is using ERJs to compete against US Airways narrowbody jets in the Norfolk-LaGuardia market.
- To supplement or replace existing jet services: RJs are also being used to supplement or replace jet services in existing markets, allowing carriers to increase frequencies or better match capacity with demand. US Airways has added four daily ERJ departures to supplement its two daily narrowbody jets serving its Pittsburgh hub from Richmond.

Exhibit 11 presents the projected RJs in North American passenger service over the next six years. Due to the large numbers of firm orders and their scheduled delivery dates, the current size of the RJ fleet is projected to more than double in the near future.

**TA - Exhibit 11**

**Projected RJs in North American Passenger Service**




*Source: ACAS Fleet Database, October 2001, Current Fleet plus Firm Orders.*

This continued growth in regional jets may have a significant impact on the development of the Virginia airport system. The availability of these jets should allow commercial service to an expanded range of markets and destinations. RJ growth will allow thinner routes to support non-stop service and will provide additional hub feed. By allowing competitive entry into markets previous dominated by a single carrier, fares in some markets may decrease. At the same time, since regional jets cost more to operate than turboprops, fares could rise in new nonstop markets or in markets where turboprop services are replaced. Finally, growth in regional jets could impact facility requirements (such as runway length requirements), and should be considered in any planning analysis.